

REMARKS

This Response is filed in reply to the Office Action mailed April 1, 2009. Claims 25, 26 and 28-51 are pending in the application. Claims 32-48 are withdrawn from consideration. Claim 25 is the sole independent claim. Claims 25, 26, 28-31 and 49-51 stand rejected under 35 U.S.C. §103(a). Applicants respectfully traverse this rejection. The Commissioner is hereby authorized to charge deposit account 02-1818 for any fees which are due and owing.

In the Office Action, the Patent Office rejects claims 25, 26, 28-31 and 49-51 under §103(a) as unpatentable over U.S. Patent Application Publication No. 2004/0043294 (hereinafter "Fukui") as a single reference. The sole independent claim 25 recites an anode comprised of a particulate anode active material, a conductive agent, and a particulate binder containing at least one compound selected from vinylidene fluoride or polyvinylidene fluoride. The binder is fused by heating and the anode material and conductive agent are prevented from being covered with binder. The Patent Office asserts that each and every aspect of the claimed invention is present within Fukui with the exception of this last, underlined aspect. For this last aspect, the Patent Office admits that although the cited reference does not recite this last aspect, it would appear that this would be the case in the cite reference since the binder fusion temperatures are present.

Applicants respectfully disagree because the Patent Office is mixing two different aspects, and Fukui in fact demonstrates the exact opposite of the claimed invention. First, the melting of the binder by heating to fuse the anode materials does not equate to preventing the binder from covering the conductive agent and anode active material, as discussed at least at [0031], and Figures 1-3. Second, Fukui in fact teaches the exact opposite of the claimed invention. As Applicants have noted, the particulate binder in the claimed invention is dispersed, not dissolved, in a dispersion medium. Applicants' Published Application, [0041]. This dispersion medium is selected such that the binder has a swelling degree of less than 10%. *Id.* "[A] swelling degree of less than 10% means that the binder does not dissolve in the dispersing medium. Thereby the binder remains particulate without being dissolved." *Id.* As the specification makes clear, this results in an anode material and conductive material that are not covered with binder, leading to better charge- discharge cycle characteristics.

In contrast, Fukui teaches exactly the opposite. In all of the examples, Fukui prepares a negative electrode mix slurry as 90 parts by weight of a mixture to which is added an 8 wt% N-

methylpyrrolidone solution containing 10 parts polyvinylidene fluoride. Fukui, [0053] That slurry is coated onto a current collector and dried. Fukui, [0054]. The result is a negative electrode in which the binder will coat the anode active material particles, exactly the opposite of the claimed invention. Note that Fukui's method is the conventional method for preparing anodes, by dissolving the binder in a solution, creating a slurry and casting the slurry on a conductor. See Applicants' Published Application, [0031]. This results in the anode material and conductive material being covered with binder. In contrast, Applicants has discovered that preparing anodes with a binder that does not dissolve in the solution and does not coat the anode active material and conductive particles leads to improved cycle characteristics.

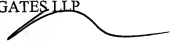
Moreover, Applicants have in fact demonstrated that the method in Fukui gives poorer results. In Comparative Example 1-1, a battery was fabricated in the same manner as Examples 1-1 and 1-2, except that the dispersion medium was N-methyl-2-pyrrolidone. Applicants' Published Application, [0077]. The binder, polyvinylidene fluoride, is well dissolved in NMP. *Id.* The binder and solvent are exactly the same as in Fukui. Compare Applicants' Published Application, [0077] with Fukui, [0053]. The results are shown in Table 1 of the instant specification, demonstrating that discharge capacity, charge/discharge efficiency, and cycle retention ratios are all lower for Comparative Example 1-1 when the binder is dissolved and results in the coating of the anode active material and conductive agent.

For these reasons, Applicants assert that Fukui does not teach or make obvious each and every aspect of the claimed invention, and therefore that the rejection is improper. Applicants respectfully request that the rejection be withdrawn and that the application be moved into allowance.

Respectfully submitted,

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